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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/825,246	04/02/2001	Sharat Singh	0225-0033.20	4459

7590 10/04/2002

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EXAMINER	
TUNG, JOYCE	
ART UNIT	PAPER NUMBER
1637	

DATE MAILED: 10/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/825,246	Applicant(s) SINGH ET AL.	
	Examiner Joyce Tung	Art Unit 1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 July 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *16-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *Detailed Action* .

Response to Amendment

1. The amendment filed 7/15/202 has been entered.

2. The provisional double patenting rejections of claims 1-7 over claims 1-3, 5-7 and 9-10 of copending application SN: 09/824,905, claims 1-15 over claims 1-19 of copending application SN: 09/825,245, claims 1-5 over claims 1-4 of copending SN: 09824851 and claims 1-4 of copending SN: 09824861 are withdrawn because of the Terminal Disclaimers filed.

3. The objections of claims 1-15 is withdrawn because of the amendment filed.

4. The rejection of claims 1-15 under 35 U.S.C. 112, second paragraph, the rejection of claims 1-3 and 10-15 under 35 U.S.C. 102(b) anticipated by Grossman (5,470,705) and the rejection of claim 5 under 35 U.S.C. 103(a) over Grossman (5,470,705) in view of Babon (5851,770) are withdrawn because of the amendment and argument.

NEW GROUND REJECTIONS

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 18, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claims 18 and 20 are vague and indefinite because it is unclear what is meant by the language "charge/mass ratio is in the range of from -0.001 to 0.5". Specifically, it is unclear how the ratio is defined and what is meant by the number -0.001 to 0.5. Clarification is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 16-17, 19-21 and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grossman (5,470,705) in view of Babon et al. (5,851,770).

Grossman et al. disclose a method of detecting a plurality of different sequences in a target sequence involving a plurality of sequence probes (See column 2, lines 54-56). The probe comprises the features of the e-tag probe as claimed in claims 16-17, 19-21 and 23-24. The probe includes a binding polymer, a polymer chain which imparts to that probe, a distinctive ratio of charge/translational frictional drag and a reporter attached to the binding polymer (See column 20, lines 52-57). The binding polymer is an oligonucleotide including at least 10-20 bases allowing hybridization to the target polynucleotide (See column 6, lines 66-67 and column 7, lines 1-10). Other binding polymers are analogs of polynucleotides, such as deoxynucleotides with thiophosphodiester linkage (See column 7, lines 11-19). The polymer chain has a ratio of charge/translational frictional drag which is evidenced by a distinctive electrophoretic mobility in a non-sieving matrix (See column 7, lines 50-64). The polymer chain can be polyethylene oxide (PEO) or a polypeptide chain where the chains are attached to different-sequence binding polymers (See column 3, lines 11-18). The teachings suggest that the charge/translational frictional drag is consisted of carbon, hydrogen, oxygen, phosphorus, nitrogen, sulfur and boron as recited in claim 24. The label refers to a fluorophore or chromophore (See column 6, lines 39-44). The features of Grossman et al.'s probe suggest the features of the claimed e-tag probe.

Grossman et al do no disclose the kit and the probe attached to a capture ligand.

Babon et al. disclose a method for detecting one or more mismatches between a first and second nucleic acid in which the heteroduplex formed between the first and second nucleic acid sequence is biotinylated and captured by binding to streptavidin-magnetic beads (See column 7,

lines 53-66). The capture ligand and capture agent includes antigen/antibody or DNA binding protein and its DNA binding site (See column 18, lines 13-24). Thus, it would have been prima facie obvious to one of ordinary skill in the art at the time of the instant invention to modify the probe of Grossman et al. wherein the capture ligand and agent are attached to the oligonucleotide probe as taught by Babon et al.. The ordinary artisan would have been motivated to make this invention because directly capturing the probe to a solid support is easy to wash away the unbound probe which increases the accuracy of the method instead of capturing the probe through the immobilized target sequence as disclosed by Grossman et al. In addition, constructing a kit including all components needed to carry out a method was routine practice in the art at the time of the instant invention. It would have been prima facie obvious to construct the kit as claimed.

In response to Applicant's argument, Applicants argue that the capture ligand disclosed by Babon et al. is attached to a target sequence, not a probe. However, although the capture ligand disclose by Babon et al. is attached to a target sequence, the target sequence and the probe both are consisted of nucleic acid sequence. Thus, the reference of Babon applied is proper. Nevertheless, a probe attached with capture ligand was well known in the art at time of the instant invention, for example, the reference of Murtagh et al. (5,744,306) discloses that a probe adopted with a moiety which can captured to a solid support (See the Abstract and column 72, lines 64-67, claim 4). Thus the reference of Babon et al. applied is proper.

9. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grossman et al. (5,470,705) in view of Babon et al. (5,851,770) as applied to claims 16-17, 19-21 and 23-24 above, and further in view of Huie et al. (5,470,967).

The teachings of Grossman et al. and Babon et al. are set forth in section 8 above. none of the references discloses that said oligonucleotide has at least on nuclease resistant linkage as claimed in claim 4.

Huie et al. disclose phosphodiester linkage in oligonucleotide analogs (See column 3, lines 59-62) and phosphorothioate diester shows increased resistance to nuclease (See column 3, lines 59-67). Thus, it would have been prima facie obvious to one of ordinary skill in the art at the time of the instant invention to use phosphodiester linkage as indicated by Huie et al. in the oligonucleotide probe of Grossman et al. to resist nuclease activity because the use of modified linkage within the oligonucleotide makes them nuclease resistant (See column 3, lines 63-67).

In response to Applicants' argument, Applicants argue that Grossman et al. and Babon et al. do not suggest using a nuclease to cleave a probe and nuclease does not always cleave every probe at precisely the same inter-nucleotide linkage. However, Grossman et al disclose polymerase/exonuclease used in the reaction (See fig. 19A-19B and column 20, lines 11-25) which is the same exonuclease used in Fig,. 3A-3C of the instant invention. Thus, it is unclear what is the difference between the teachings of the prior art and the invention. Furthermore, it is unclear where is the nuclease-resistant linkage located on the oligonucleotide. Clarification is required.

Applicants further argue that the purpose of Huie et al. to apply nuclease-resistant linkage is for therapeutic purpose. However, the instant invention claim a set of electrophoretic probe in which the function language has no patentable weight. Thus, the reference of Huie et al. applied is proper.

10. Any inquiries concerning this communication or earlier communications from the examiner should be directed to Joyce Tung whose telephone number is (703) 305-7112. The examiner can normally be reached on Monday-Friday from 8:00 AM-4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached at (703) 308-1119 on Monday-Friday from 10:00 AM-6:00 PM.

Any inquiries of a general nature or relating to the status of this application should be directed to the Chemical/Matrix receptionist whose telephone number is (703) 308-0196.

11. Papers related to this application may be submitted to Group 1600 by facsimile transmission. Papers should be faxed to Art Unit 1637 via the PTO Fax Center located in Crystal Mall 1 using (703) 305-3014 or 308-4242. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989).

Joyce Tung

September 27, 2002

GARY BENZION, PH.D
SUPERVISORY PATENT EXAMINER
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